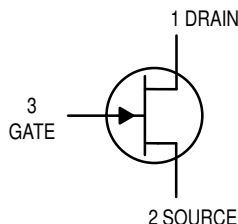


JFET VHF Amplifier

N-Channel — Depletion



MPF102



CASE 29-04, STYLE 5
TO-92 (TO-226AA)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	25	Vdc
Drain-Gate Voltage	V_{DG}	25	Vdc
Gate-Source Voltage	V_{GS}	-25	Vdc
Gate Current	I_G	10	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	350 2.8	mW mW/ $^\circ\text{C}$
Junction Temperature Range	T_J	125	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Gate-Source Breakdown Voltage ($I_G = -10\ \mu\text{Adc}$, $V_{DS} = 0$)	$V_{(BR)GSS}$	-25	—	Vdc
Gate Reverse Current ($V_{GS} = -15\ \text{Vdc}$, $V_{DS} = 0$) ($V_{GS} = -15\ \text{Vdc}$, $V_{DS} = 0$, $T_A = 100^\circ\text{C}$)	I_{GSS}	— —	-2.0 -2.0	nAdc μAdc
Gate-Source Cutoff Voltage ($V_{DS} = 15\ \text{Vdc}$, $I_D = 2.0\ \text{nAdc}$)	$V_{GS(off)}$	—	-8.0	Vdc
Gate-Source Voltage ($V_{DS} = 15\ \text{Vdc}$, $I_D = 0.2\ \text{mAdc}$)	V_{GS}	-0.5	-7.5	Vdc

ON CHARACTERISTICS

Zero-Gate-Voltage Drain Current ⁽¹⁾ ($V_{DS} = 15\ \text{Vdc}$, $V_{GS} = 0\ \text{Vdc}$)	I_{DSS}	2.0	20	mAdc
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SMALL-SIGNAL CHARACTERISTICS

Forward Transfer Admittance ⁽¹⁾ ($V_{DS} = 15\ \text{Vdc}$, $V_{GS} = 0$, $f = 1.0\ \text{kHz}$) ($V_{DS} = 15\ \text{Vdc}$, $V_{GS} = 0$, $f = 100\ \text{MHz}$)	$ y_{fs} $	2000 1600	7500 —	μhos
Input Admittance ($V_{DS} = 15\ \text{Vdc}$, $V_{GS} = 0$, $f = 100\ \text{MHz}$)	$\text{Re}(y_{is})$	—	800	μhos
Output Conductance ($V_{DS} = 15\ \text{Vdc}$, $V_{GS} = 0$, $f = 100\ \text{MHz}$)	$\text{Re}(y_{os})$	—	200	μhos
Input Capacitance ($V_{DS} = 15\ \text{Vdc}$, $V_{GS} = 0$, $f = 1.0\ \text{MHz}$)	C_{iss}	—	7.0	pF
Reverse Transfer Capacitance ($V_{DS} = 15\ \text{Vdc}$, $V_{GS} = 0$, $f = 1.0\ \text{MHz}$)	C_{rss}	—	3.0	pF

1. Pulse Test; Pulse Width $\leq 630\ \text{ms}$, Duty Cycle $\leq 10\%$.

POWER GAIN

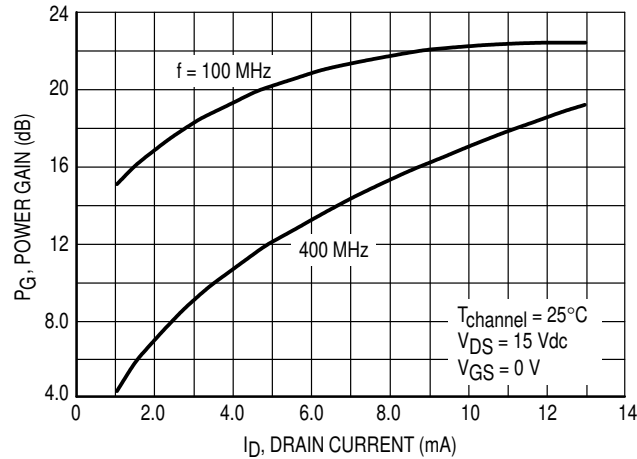


Figure 1. Effects of Drain Current

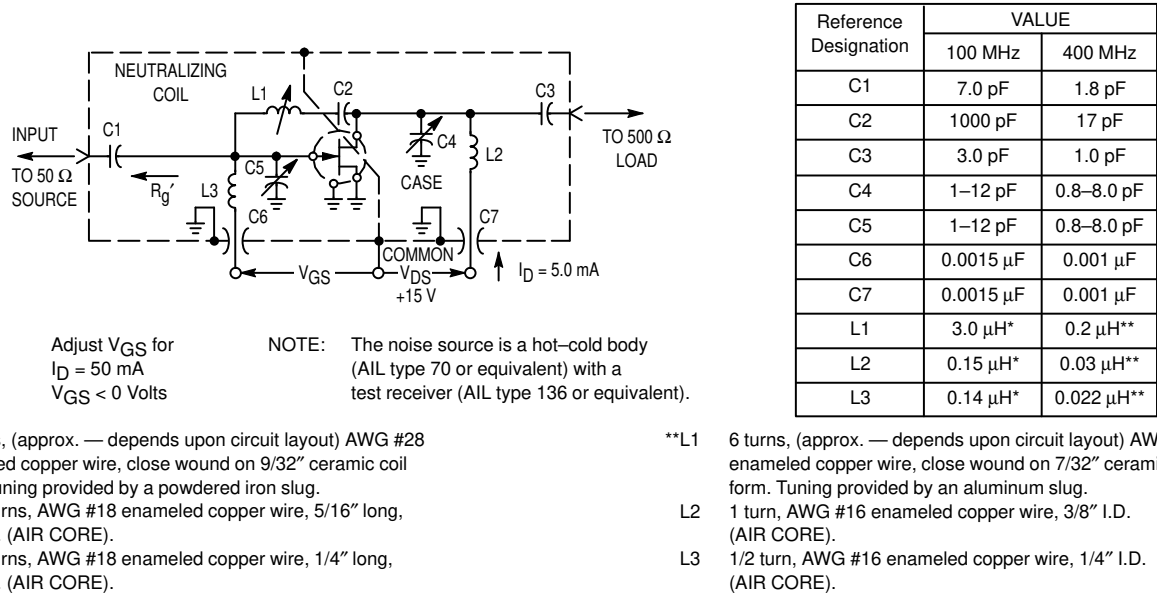
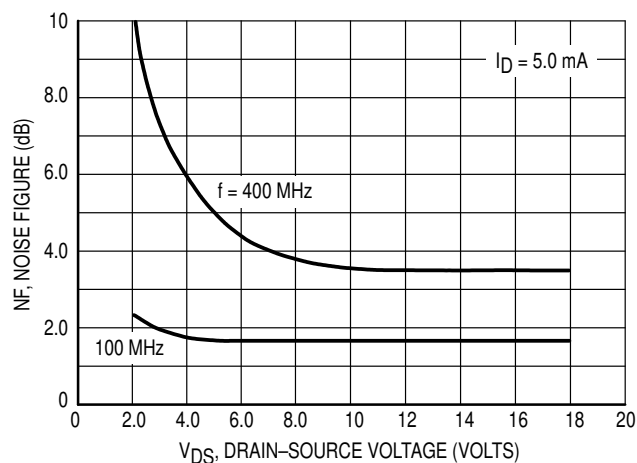
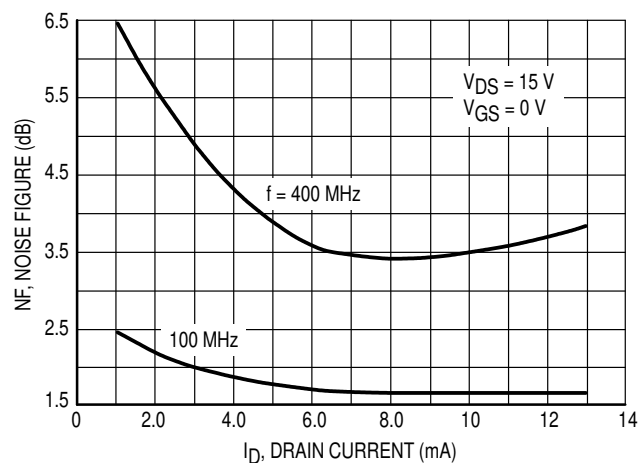
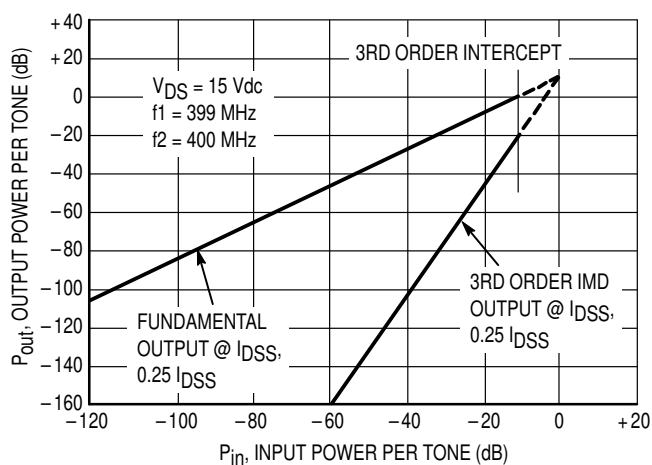
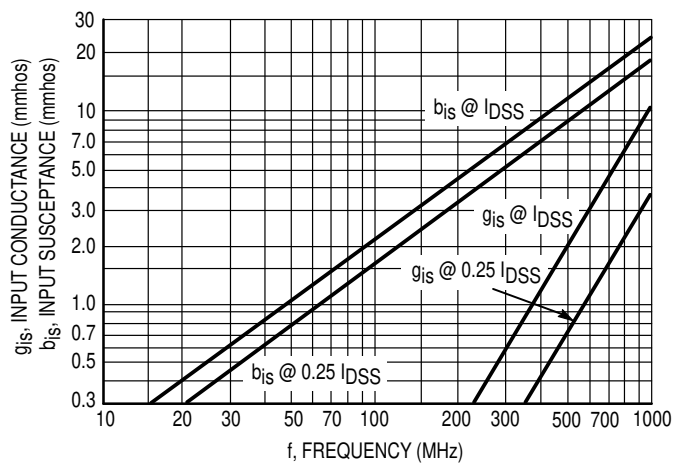
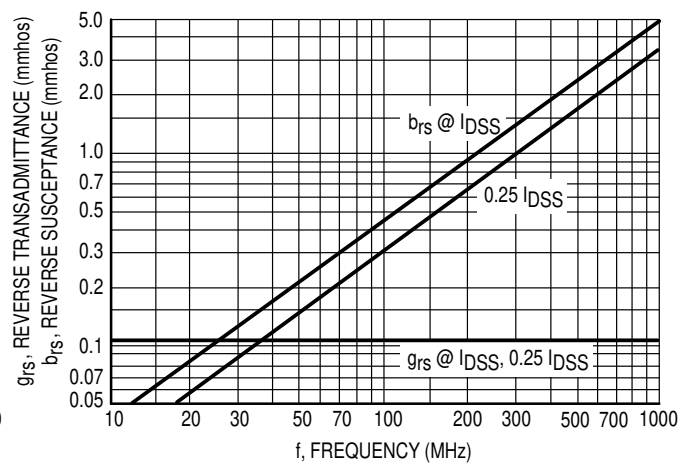
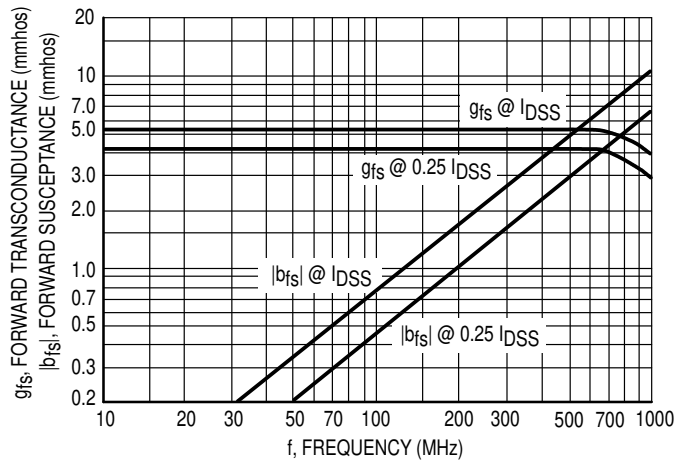
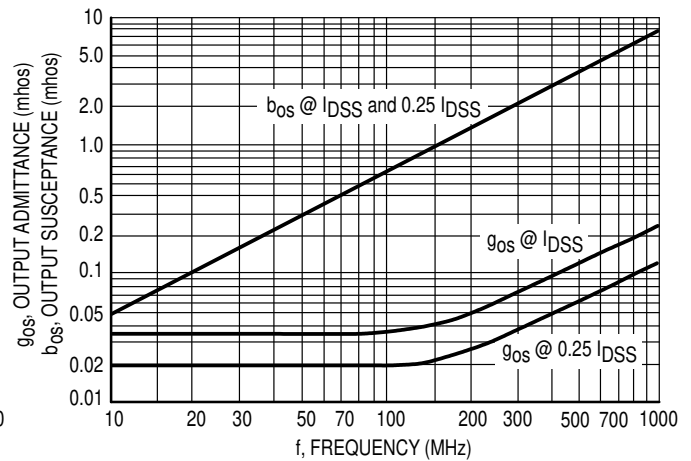


Figure 2. 100 MHz and 400 MHz Neutralized Test Circuit

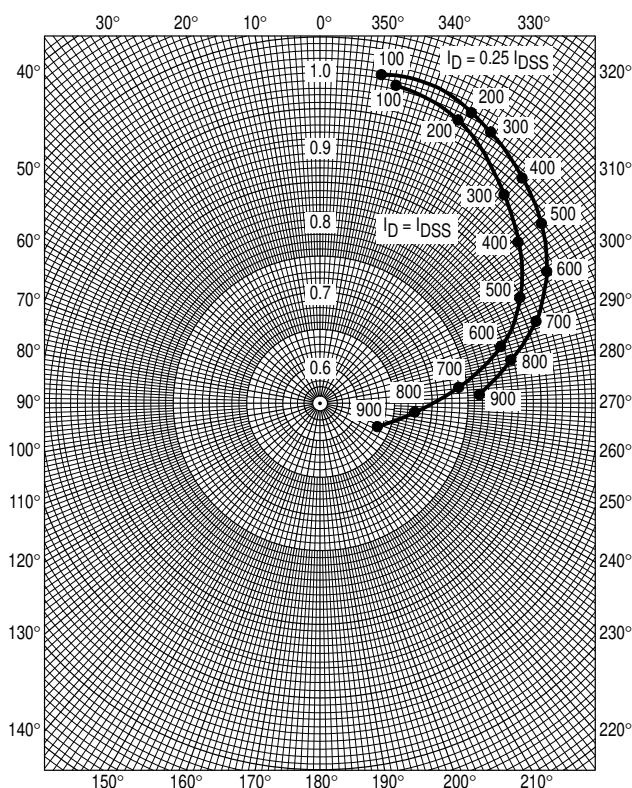
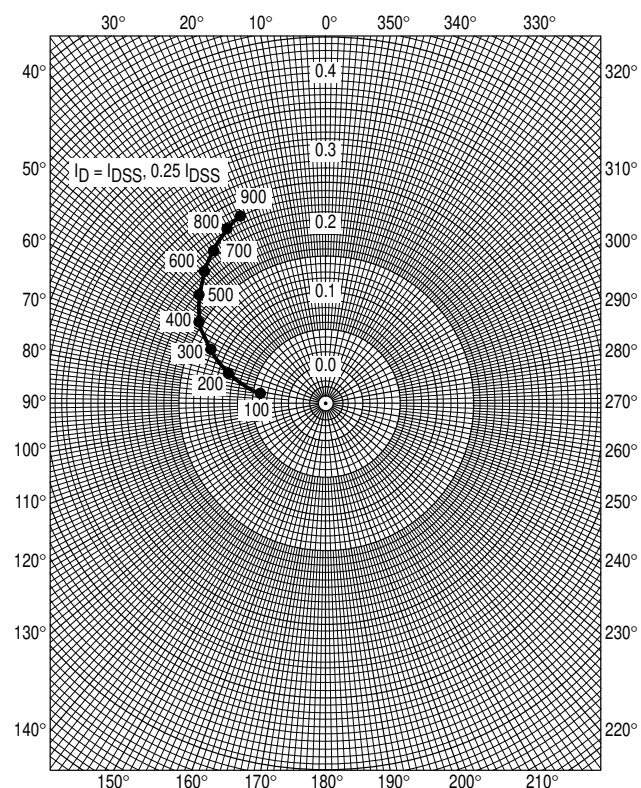
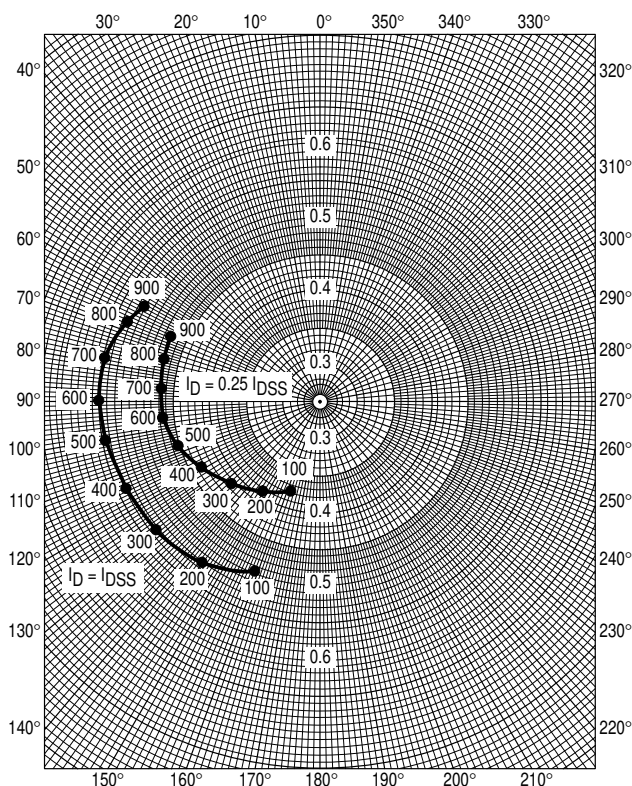
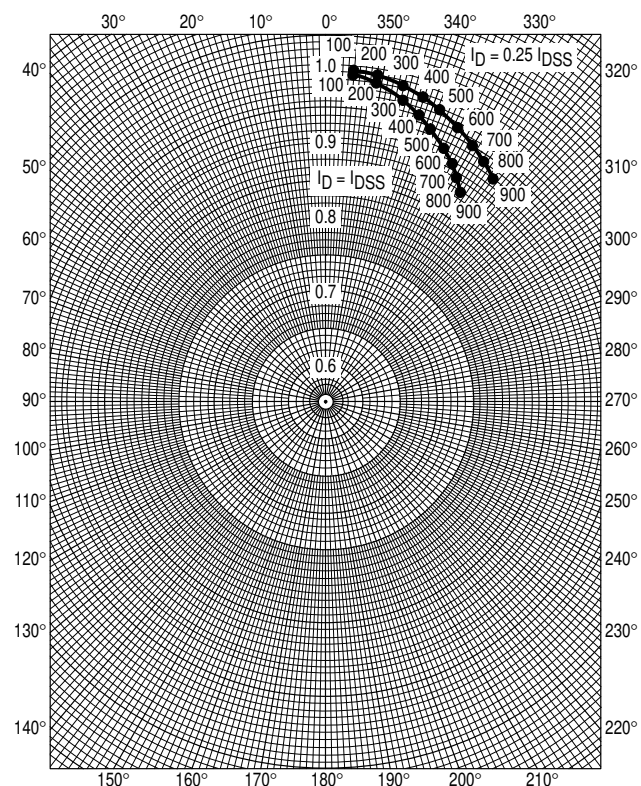
NOISE FIGURE $(T_{\text{channel}} = 25^{\circ}\text{C})$ **Figure 3. Effects of Drain-Source Voltage****Figure 4. Effects of Drain Current****INTERMODULATION CHARACTERISTICS****Figure 5. Third Order Intermodulation Distortion**

COMMON SOURCE CHARACTERISTICS

ADMITTANCE PARAMETERS

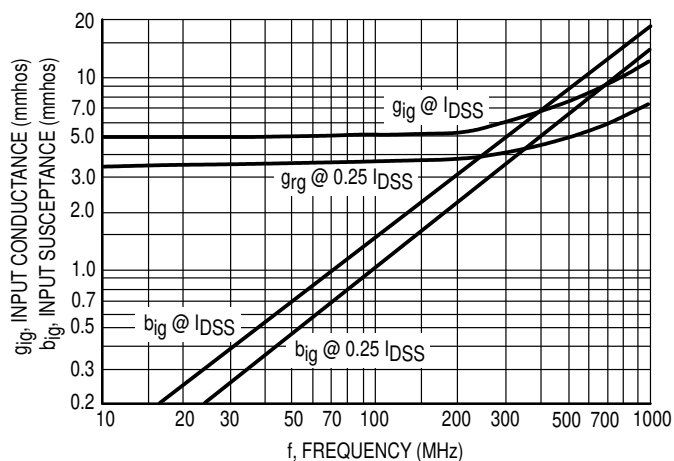
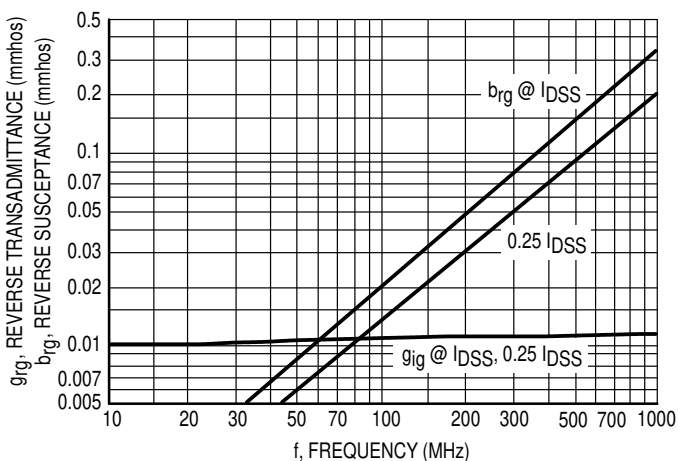
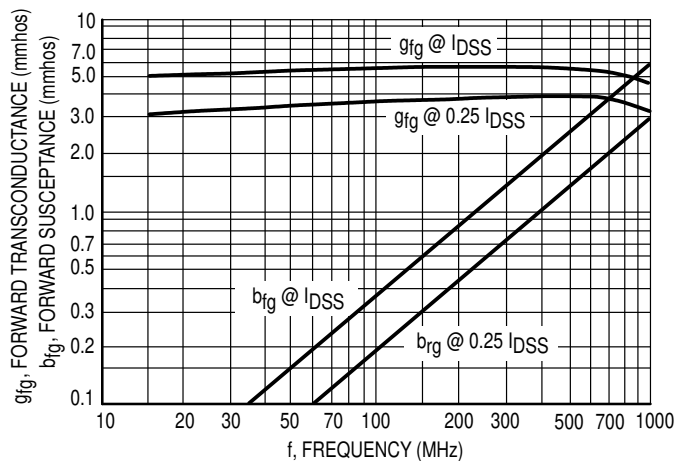
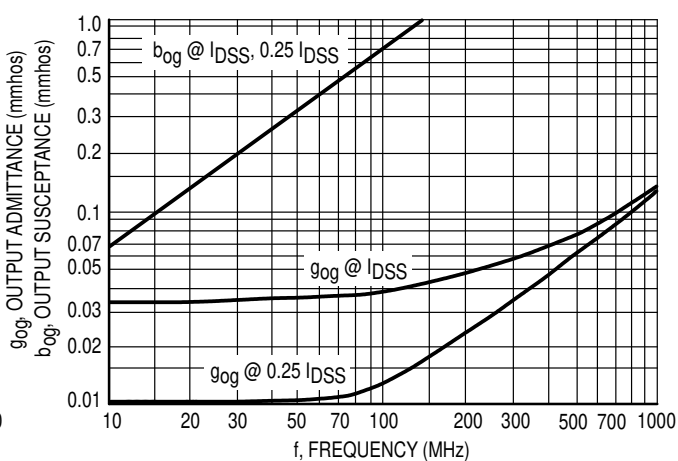
(V_{DS} = 15 Vdc, T_{channel} = 25°C)Figure 6. Input Admittance (y_{is})Figure 7. Reverse Transfer Admittance (y_{rs})Figure 8. Forward Transadmittance (y_{fs})Figure 9. Output Admittance (y_{os})

COMMON SOURCE CHARACTERISTICS
S-PARAMETERS
 ($V_{DS} = 15\text{ Vdc}$, $T_{\text{channel}} = 25^\circ\text{C}$, Data Points in MHz)

Figure 10. S_{11s} Figure 11. S_{12s} Figure 12. S_{21s} Figure 13. S_{22s}

COMMON GATE CHARACTERISTICS

ADMITTANCE PARAMETERS

(V_{DG} = 15 Vdc, T_{channel} = 25°C)Figure 14. Input Admittance (y_{ig})Figure 15. Reverse Transfer Admittance (y_{rg})Figure 16. Forward Transfer Admittance (y_{fg})Figure 17. Output Admittance (y_{og})

COMMON GATE CHARACTERISTICS

S-PARAMETERS

($V_{DS} = 15\text{ Vdc}$, $T_{\text{channel}} = 25^\circ\text{C}$, Data Points in MHz)

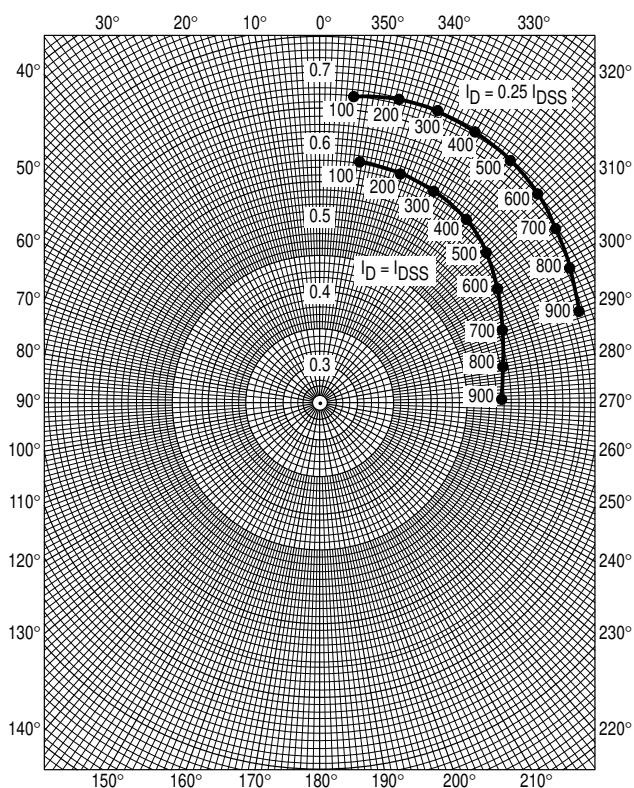


Figure 18. S_{11g}

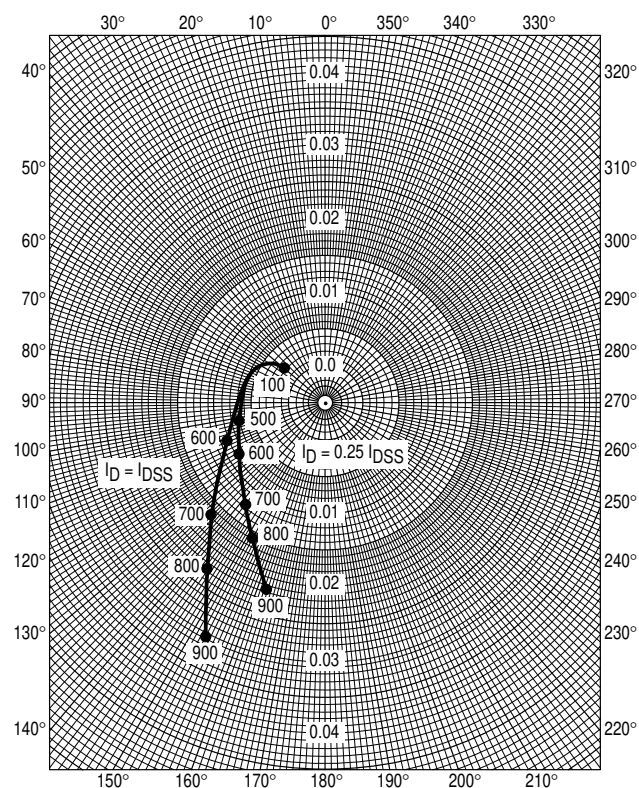


Figure 19. S_{12g}

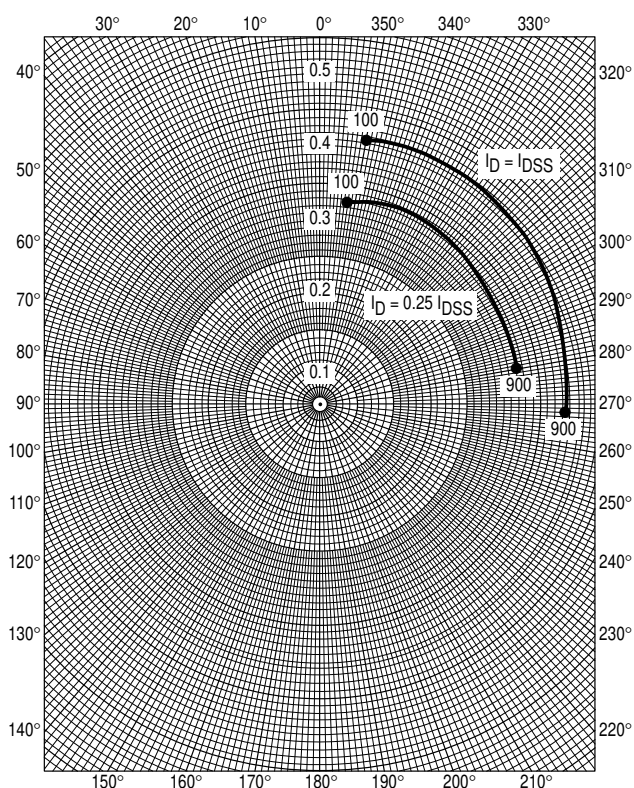


Figure 20. S_{21g}

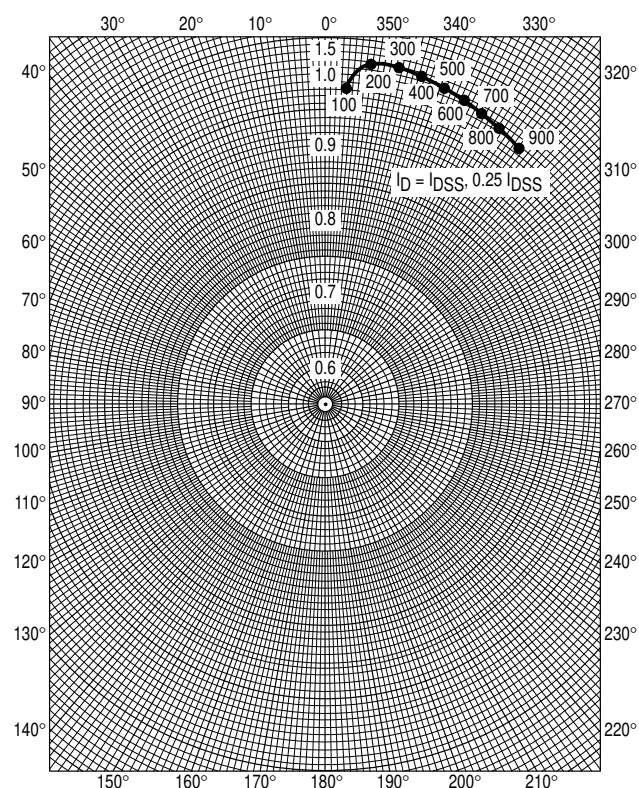
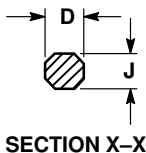
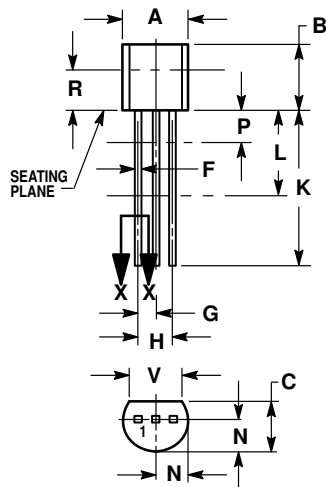


Figure 21. S_{22g}

PACKAGE DIMENSIONS



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN P AND L. DIMENSION D AND J APPLY BETWEEN L AND K. MINIMUM LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.022	0.41	0.55
F	0.016	0.019	0.41	0.48
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	—	12.70	—
L	0.250	—	6.35	—
N	0.080	0.105	2.04	2.66
P	—	0.100	—	2.54
R	0.115	—	2.93	—
V	0.135	—	3.43	—

**CASE 029-04
(TO-226AA)
ISSUE AD**

STYLE 5:

- PIN 1. DRAIN
- SOURCE
- GATE

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